Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-16.   (Canceled)

17. (New)   A method for determining imaging characteristics of an object, the method comprising:

casting incident light in a linear shape from one light source onto a specific location on an object;

capturing detected light with one image sensor while casting the incident light, the detected light including at least (i) light from reflection of the incident light, and (ii) light from scattering of the incident light;

generating a record associated with the specific location from the detected light, the record including at least (i) first information about the reflection of the incident light, and (ii) second information about the scattering of the incident light; and

determining an object profile for the specific location and an object scattering property for the specific location by reading the first and second information in the record associated with the specific location.

18.   (New) The method of claim 17, wherein generating the record comprises forming a first image from the captured light.

19.   (New) The method of claim 17, wherein:

the light source is a laser forming a line of laser light on the object;

the first image contains a profile corresponding to the line of laser light on the object;

5   the object profile is determined using the profile in the first image; and

the object scattering property is determined using an intensity distribution of the profile in the first image.

20.   (New) The method of claim 19, wherein determining the object scattering property comprises:

identifying a middle area and an edge area in the intensity distribution; and

comparing an intensity in the edge area with at least an intensity in the middle

5   area.

21.   (New) The method of claim 18, wherein generating the record further comprises processing the first image to generate a second image having a reduced data quantity compared to the first image.

22.   (New) The method of claim 21, wherein the first image includes image information distributed in rows and columns that represents at least part of the linear shape, and wherein the method further comprises:

(i) successively selecting respective subsets of the rows;

5   (ii) for each row in each of the subsets, determining whether the row's portion of the image information meets a criterion, and if so registering in the record any of the columns where the criterion is exceeded; and

(iii) generating a representative row for each of the subsets using the image information of the rows in the respective subset, the second image formed by the

10   representative rows and containing a version of the linear shape of the incident light.

23.   (New) The method of claim 22, wherein generating each representative row comprises:

processing the portion of the image information of each row in the subset; and

detecting, while processing, whether a sum of added image information for any of

5   the columns exceeds the criterion.

Applicant : Astrom et al.
Serial No. : 10/774,948
Filed : February 10, 2004
Page : 4 of 11

Attorney's Docket No.: 26074-0002US1 / PL70020US00

24. (New) The method of claim 23, wherein the processing comprises summing the portion of the image information of each row in the subset.

25. (New) The method of claim 23, wherein the processing comprises performing a max operation on the portion of the image information of each row in the subset.

26. (New) The method of claim 17, wherein the object is elongate in one direction essentially perpendicular to the linear shape of the incident light.

27. (New) The method of claim 17, wherein at least one of the light source and the object is moving while the incident light is cast and the detected light is captured.

28. (New) A system comprising:

one light source casting incident light in a linear shape onto a specific location on an object;

one image sensor capturing detected light while the incident light is being cast, the detected light including at least (i) light from reflection of the incident light, and (ii) light from scattering of the incident light; and

an image-processing unit generating a record associated with the specific location from the detected light, the record including at least (i) first information about the reflection of the incident light, and (ii) second information about the scattering of the incident light;

wherein the image-processing unit determines an object profile for the specific location and an object scattering property for the specific location by reading the first and second information in the record associated with the specific location.

29. (New) The system of claim 28, wherein the record comprises a first image formed from the captured light.

30. (New) The system of claim 29, wherein:

the light source is a laser forming a line of laser light on the object;

the first image contains a profile corresponding to the line of laser light on the

object;

5   the object profile is determined using the profile in the first image; and

the object scattering property is determined using an intensity distribution of the

profile in the first image.

31.   (New) The system of claim 29, wherein the image-processing unit determines the

object scattering property by:

identifying a middle area and an edge area in the intensity distribution; and

comparing an intensity in the edge area with at least an intensity in the middle

5   area.

32.   (New) The system of claim 29, wherein the image-processing unit generates the

record by processing the first image to generate a second image having a reduced data

quantity compared to the first image.

33.   (New) The system of claim 32, wherein the first image includes image

information distributed in rows and columns that represents at least part of the linear

shape, and wherein the image-processing unit further:

(i) successively selects respective subsets of the rows;

5   (ii) for each row in each of the subsets, determines whether the row's portion of

the image information meets a criterion, and if so registers in the record any of the

columns where the criterion is exceeded; and

(iii) generates a representative row for each of the subsets using the image

information of the rows in the respective subset, the second image formed by the

10   representative rows and containing a version of the linear shape of the incident light.

34.   (New) The system of claim 33, wherein in generating each representative row the

image-processing unit:

processes the portion of the image information of each row in the subset; and

detects, while processing the portion of the image information of each row in the

5   subset, whether a sum of added image information for any of the columns exceeds the

criterion.

35.   (New) The system of claim 34, wherein the image-processing unit sums the portion of the image information of each row in the subset.

36.   (New) The system of claim 34, wherein the image-processing unit performs a max operation on the portion of the image information of each row in the subset.

37.   (New) The system of claim 28, wherein the object is elongate in one direction essentially perpendicular to the linear shape of the incident light.

38.   (New) The system of claim 28, wherein at least one of the light source and the object is moving while the light source casts the incident light and the image sensor captures the detected light.